IN THE CLAIMS

Please cancel claims 1-14 and add claims 15-29.

Independent Claim 15 reads on all figures.

Claim 16 is dependent on claim 15, but if claim 15 is rejected, claim 16 can be can be made independent. Claim 16 reads on Fig 5A. 5B, 6A, 6B, 7A, 7B, 9C, 9D, 10

Claim 17 is dependent and reads on Fig 5A, 5B

Claim 18 reads on Fig 7A

Claim 19 is dependent and reads on Fig 7B

Independent Claim 20 reads on Fig 5C and FD but with intake structure as 6A

Independent claim 21 reads on Fig 1A, 1B, 2A, 2B, 3A, 4A, 8A, 8B, 8C, 8D, 8E, 8F, 8G, 8H, 9A, 9B

Claim 22 is dependent on claim 20 and reads on Fig 1C and Fig 1D

Claim 23 reads on Fig 2C and Fig 2D

Claim 24 reads on 8A - 8H, 9A, 9B

Claim 25 reads on 8A – 8H

Claim 26 reads on 5E and depends on claim 15

Art Unit – 3745
App. No. 10/804 709

Claim Rejection USC 112

Claims 1 – 16, 11 – 14 you rejected as being indefinite for failing to point out the and distinctly claim the subject matter which the inventor regards as the invention.

I have cancelled claims 1 – 14 and added claims 15 – 20, with the claims having addition information as to the claimed invention. In my new claims, I first outlined what the invention is, then outlined the structure of the invention, then outlined the function of the invention. This has made some claims lengthy. Since the structure of some art is somewhat similar, I have tried to point out the differences in intent, as well as function, and have also stated that both often are completely different to my invention by citing difference with centrifugal pumps, since some of the cited art claims centrifugal pump function.

Claim Rejection – 35 USC & 102

In rejecting claim 1 and 3 the rejection is on being anticipated by Price, 3698832. Price has indeed a rotor element having an inner cylindrical cavity and an outer cylindrical surface, and at least one passage but that passage does not intersect the cylindrical inner rotor cavity tangentially in the direction of rotation since it intersects in the opposite direction to rotation. The width of the fluid passage is not greatest within the fluid passage, but smallest. Vanes 20 do intersect the intake plenum tangentially, but are not angled from the inner tip away from the direction of rotation, but toward the direction of rotation. Also, the fluid is not contained within the fluid passage due to the rotor being shown <u>not</u> being in close proximity to the housing wall. Thus I don't feel that the cited art of Price was descriptive of claim 1 or claim 3, or for that matter any of the claims.

Claim Rejection – 35 USC 103

I believe this rejection is the fault of my trying to mix apples and oranges in the claims. There are two basic intake geometries listed as inventions, both are means of directing the intake fluid. So I am redoing the claims to make the inventions separate and clear. In

the first claim involving purely tangentially directed intake, Ask doesn't apply at all. This is the claim that specified a conical rotor, conical mating housing etc. In this invention the inlet fluid does not enter the pump axially on the axis of revolution as Ask shows.

CLAIM 15

A rotary kinetic pump which operates on principles of inertia and momentum and also by the conservation of angular momentum, as contrasted with centrifugal pumps, turbines, and propellers, in which blades strike a fluid; but with this inertial pump instead having rotating chambers in which are filled with fluid by a NPSH driven by atmospheric pressure, with the fluid gaining rotational energy within any enclosed chamber through force being transmitted to the fluid by a curved housing wall rather than by a rotor blade, and the enclosed fluid being allowed to exit through one or more tangentially orientated rotary discharge ports; and with the structure of said rotary kinetic pump consisting of:

a rotor having a radially inner surface and a radially outer surface, with at least one communicating passage, and with the radially inner surface forming an intake plenum, and the radially outer surface and end surfaces rotating in close proximity to a cavity in a stator housing member, and at the juncture of the radially outer surface of said rotor, at least one tangential discharge port for a short angular sector of rotation is passing through the stator housing member wall so that fluid is discharged sinusoidally and intermittently as the rotor passage passes the discharge port, and outside of the angular sector of rotation of the discharge port during rotation the passage is closed by the close proximity contact with the inner cavity wall of the housing at least momentarily, such that fluid is contained within the rotor passage and is not moving with respect to said rotor passage, so that when said rotor passage passes said tangential discharge port, the fluid in the radially outer portion of said rotor passage is ejected by momentum, and leaves a vacuum in the radially inner portion of said rotor passage, such that fluid enters the radially inner fluid passage by NPSH, and the fluid is only drawn in when the passage is open to said tangential discharge port, so that intake only takes place

for a limited angle of rotation for said fluid passage, and when fluid is passing through an extended passage which includes the rotor passage plus discharge port, the cross sectional area at the radially inner passage entrance is substantially larger than any downstream area, such that the higher velocity discharge fluid capacity does not exceed the intake capacity, and that the intake plenum has at least one fluid intake means passing through the stator housing wall in which fluid is aimed toward the angular sector of intake to any open rotor passage, such that fluid, driven by NPSH at that angular sector enters the fluid passages in said rotor in a direct manner in which little force exists between the entering fluid and the rotor passage walls.

CLAIM 16

A rotary kinetic pump as in claim 15, which operates on principles of inertia, and momentum and, by the conservation of angular momentum, as contrasted by centrifugal pumps, turbines, and propellers, in which blades strike a fluid, but with this inertial pump instead having rotating chambers in which are filled with fluid by NPSH driven by atmospheric pressure, and with the fluid gaining rotational energy within the enclosed chamber through force being transmitted to the fluid by a curved housing wall rather than by a rotor blade, and the enclosed fluid being allowed to exit through one or more tangentially orientated rotary discharge ports; with the structure of said rotary kinetic pump consisting of:

a conical rotor hub with shaft and fixed vanes protruding from the convex surface of said conical hub and rotating in close proximity within an inner convex cavity of a housing and said housing also having a portion of said cavity which is not in close proximity, but which is located near the axis of revolution and is an intake plenum, which has one or more intake ports passing through said cavity wall to communicate with said rotor which are so aligned that intake fluid enters said intake plenum from a side wall of said housing cavity wall at an oblique angle and not passing through the axis of revolution, but instead passes at the conic angle of the rotor with

the axis, near the axis, such that each intake stream travels in a straight line, entering chambers formed between adjacent vanes tangentially, and such that the intake fluid is moving in essentially the same direction as the inner vane tips, and at essentially the same velocity, and the fluid enters and fills said chambers by NPSH, and said chambers, when filled, are contained and bounded by adjacent vanes, the rotor hub, and the inner surface said housing cavity, and also bounded on the radially inner surface by an isobar of equal pressure, such that the fluid is contained and rotating, and that the fluid gains energy by being deflected by the arcuate inner housing cavity wall, such that a pressure gradient is formed within the enclosed fluid, and as said enclosed fluid chamber passes any radially outer tangential discharge port through said housing cavity wall, said tangential discharge being oriented in the direction of rotation, the contained fluid is allowed to discharge by momentum creating a vacuum radially inward in said rotor chamber, causing it to fill by NPSH, and while discharging, said rotor chamber becomes a fluid passage, intermittently and sinusoidally opening and closing, and when open, said fluid passage then becomes an extended passage, being the passage through the rotor and plus also being bounded by said inner cavity wall of said housing as well as the tangential discharge duct, such that the extended passage is a converging geometry in a radially outward direction with the radially inner fluid entrance being larger than the fluid discharge of such a ratio that the passage allows as much fluid in as out, such that fluid passes through the pump with little interaction with the vanes, unlike centrifugal pumps, but being a positive displacement since fluid is contained, then displaced; and such that only the contained fluid that is being discharged is near the radially outer portion of said rotor passages, such that fluid is discharged with a velocity approximately equal to the radially outer rotor tip velocity, and thus higher head can be reached, and it being desirable to have more than one discharge port because radial load is reduced.

CLAIM 17

A pump as in claim 15, having at least one intake duct which is not axial and at least one tangential discharge port, and at the intake, a volute is made in the concave, conical housing wall in order to keep the flow entering said rotor passages directly and tangentially.

CLAIM 18

A pump as in claim 15 engine driven in a boat as a means of propulsion with two intake ducts through the bottom of the vessel hull, and the intake fluid going toward the stern of the vessel, and the pump having two intake ports and at least two tangential discharge ports with the high momentum discharge fluid directed back from the stern of the vessel to provide a marine jet pump which propels the vessel by momentum change, and the propulsion jet streams having the ability to steer the vessel by opening or closing valves in the two jet streams.

CLAIM 19

A pump as in claim 15 that is engine driven similar to an outboard motor, with the tangential intake duct aiming forward below the water line of a small vessel, and the tangential discharge duct aimed to the stern of the vessel, and with the pump being able to be turned in an arc to be able to steer the vessel, thus becoming an outboard jet pump.

CLAIM 20

A fluid motor with a tangential intake geometry similar to the pump intake in claim 16 but with 2 or more inlet ducts, and a conical rotor with shaft fitted for rotation, the convex rotor surface fitted with arcuate spiraling vanes fixed to the convex surface and rotating in close proximity to a concave housing surface, and

said spiraling vanes arching opposite to the direction of rotation and are more in a radial direction at the radially inner intersection with the incoming fluid stream, but near to tangential at the radially outer rotor diameter similar to centrifugal vane pump design, and so that high velocity fluid impinges on the following side of said vanes and the housing member having an open discharge extending 360 degrees of rotation, such that the fluid exits from the chambers between vanes tangentially in the direction opposite to the direction of rotation, and the vanes arched back such that the fluid strikes the vanes at a near to normal direction throughout the sector of impact from the high velocity fluid, and such that the fluid entering with high momentum, delivers energy to rotor by impact, causing the rotor to rotate and slowing the fluid to near to being stopped, the rotor gaining nearly all the energy from the fluid; and with the motor starting from rest as a jet device with the fluid stream exiting the rotor tangentially with force, but during rotation under load, the exit fluid loses nearly all kinetic energy, and the rotor gains the energy.

CLAIM 21

A rotary kinetic pump which operates on principles of in inertia, in particular, by the conservation of angular momentum, as contrasted with centrifugal pumps, turbines, and propellers, in which blades strike a fluid, but with my inertial pump instead having rotating chambers which are filled with fluid by NPSH driven by atmospheric pressure, with the fluid gaining rotational energy within the enclosed chamber through force being transmitted to the fluid by a curved housing wall rather than by being struck by a rotor blade, and the enclosed fluid being allowed to exit the chamber through any tangentially orientated rotary discharge port; and with the structure of said rotary kinetic pump consisting of a rotor hub with shaft having an radially inner projecting conical protrusion and being more cylindrical on the radially end and outer surfaces, with vanes protruding from said radially outer and end rotor surfaces, and said vanes being tangent to the direction of rotation on the radially inner vane tips, but more radial in orientation at the the radially outer vane tips, and each vane being angled back from the direction of

rotation from a sharp radially tangential inner tip to a more radially orientated outer tip at the radially outer diameter, and having fewer vanes than normally found in a typical centrifugal pump, and having adjacent vanes forming a rotating chamber the which gains rotational energy and a pressure gradient within said chamber, and which is bounded by the rotor, adjacent rotor vanes, a radially inner surface of revolution being a surface of equal pressure isobar, and a radially outer surface of revolution also a surface of equal pressure, and also a stator housing element consisting of a cavity in which said rotor rotates with the rotating vanes in close proximity to said cavity surface except at the radially inner portion of said cavity where an intake plenum cavity is formed which has an axial intake duct through said stator housing which is an axial diverging shape toward the intake plenum, and said stator cavity also having one or more tangential discharge ports passing through said radially outer stator housing wall in the direction of rotation to allow the rotating contained fluid in any rotor chamber to pass by momentum tangentially through any of said tangential discharge ports, thus completing the basic structure, but with the function of the pump being such that when any fluid contained any rotor chamber passes any tangential discharge port, the radially outer fluid exits tangentially from the radially outer boundary of said chamber, and is ejected at approximately the tip velocity of the radially outer rotor tip, and this creates a vacuum zone at the radial inner boundary of said chamber, causing fluid to be drawn into the chamber which has become extended fluid passage which opens intermittently and sinusoidally as fluid is being discharged and entering, and the said extended passage being the rotor chamber shape, plus a boundary on the inner cavity surface of the stator housing, which changes sinusoidally in length, plus the shape of the tangential discharge port; and that the shape of said extended fluid passage is essential to the invention, that the passage must be much larger in cross section at the radially inner opening into the fluid passage, and the passage must be converging in cross sectional area with increased radial distance; with the radially inner opening much larger in cross-sectional area than the discharge port; such that the differential fluid velocities at inlet and outlet are taken in account so that the pump is not trying have the

discharge flow exceed the intake flow and thus causing cavitation, and also because the passages pump fluid intermittently and sinusoidally, unlike centrifugal pumps which pump continuously; and still another essential and critical design factor is how the fluid enters the rotor chambers, which is as follows; the fluid enters by an axial intake that becomes divergent due to a divergent chamber entry as well as fluid being forced radially outward by the conical rotor hub, such that the fluid enters the intake plenum with a radial flow component, but since this design has each rotor passage opening intermittently and sinusoidally at the same angular sector, the fluid within the intake plenum is caused to rotate as a vortex by the inner vane tips, since the fluid cannot enter the rotor chambers continuously as it does in a centrifugal pump, this causes the fluid to enter tangentially into the rotor chambers rather than radially, and since it enters tangentially into the chambers that are angled away from the direction of rotor motion, and since the inner vane tip is sharp and intersects the intake fluid at the radially outer plenum surface tangentially, there is very little contact or force with the vane surface, either on the leading edge or the following edge, since at that juncture, the incoming fluid is moving both in the same direction and with near the same velocity as the inner vane tip, such that fluid enters the angled back rotor chamber by only being forced by atmospheric pressure acting against the rotating suction caused by discharging fluid in the chamber, and this is completely opposite in function to a centrifugal pump, axial turbine, or propeller, and so this allows fluid to enter each larger rotor fluid chamber intermittently and sinusoidally with much less velocity between the fluid and the vanes, and with almost no force, having the result that there is little fluid shear, allowing the pumping of shear sensitive fluids, and also there is less wear due to less velocity, and also there is no source of cavitation or vane tip erosion as common with centrifugal pumps, and since there are fewer vanes than centrifugal pumps, generally only four or less vanes, the fluid passages are much larger and can accommodate debris without clogging and the sharp inner vanes tips can chop up incoming debris; and the pump being more robust and of simpler geometric design, and being more powerful for size results in advantages both in cost and

performance; thus describing a pump that functions in a different manner from centrifugal pumps and allows many new options and variations.

CLAIM 22

A pump as in claim21 in which the inlet duct has spiral guides to direct the intake fluid into the rotor passages.

CLAIM 23

A pump as in claim 21 in which the rotor has a center cone, which moves the incoming fluid outward radially and the cone also has small radially attached vanes, which impart rotary motion to the inlet fluid within the intake plenum.

CLAIM 24

A pump as in claim 21 in which said housing cylindrical chamber cavity has at least two discharge ports which are supplied with valves in order to open or close, and each discharge port being located on a different radius from the axis of rotation and each discharge port corresponding to a different pressure isobar, such that the pressure output of the pump may be chosen by choosing different discharge ports.

CLAIM 25

A pump as in claim 21 in which the shape of said chamber cavity is a conic frustum with the base being perpendicular to the axis of rotation, such that the axial width of the chamber decreases with increasing radius from the axis and the ports described in claim 24 are longer in sector opening at smaller radial distance from the axis of rotation which allows greater flow rates at the longer port openings.

CLAIM 26

A pump as in claim 21 in which said intake means is to allow slurries or

sludge, or other semi-liquid fluids to enter said pump, and having additional intake ports into the primary intake duct with valves joining said slurry intake in said pump for water entry.

CLAIM 27

A fluid pump as in claim 21 in which the pump is to provide the separation of dense particles entrained within the fluid, such that the pump has two discharge ports, with the port at a further radial distance from the axis of rotation having a bleed control valve and being used for particle separation, and the remaining port can be used for thrust momentum and to remove less dense entrained material, thereby.

CLAIM 28

A pump as in claim 21 in which the vane tips at the inner plenum are tangential, and a fluid passage between adjacent vanes are near to tangential at the radially inner fluid entrance in the rotor passage, and said passage curves toward radial at the radially outer rotor surface, then continues in a peripheral direction away from the direction of rotation, forming a peripheral portion of the rotor passage, resembling a groove, such that said peripheral passage is contained as a discrete volume, and is discharged when the said peripheral passage passes a tangential discharge port, such that the volume per passage can be controlled much in the same manner as a positive displacement, and also the peripheral containment exits at the highest fluid velocity, being at the rotor periphery.